CIRCUIT DESCRIPTION

7

CD-1C912-01
ISSUE 3B
APPENDIX 4B
DWG ISSUE 15B
DISTN CODE 1N98

COMMON SYSTEMS
MAINTENANCE FRAME
CIRCUIT
ARRANGED FOR ESS NO. 2B AND 3

Changes

D. Description of Changes

D.1 Provided access to additional contacts of PASS and FAIL relays in the Systems Status Panel Relay circuit.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 2511-CE-TSG

Printed in U.S.A.

CIRCUIT DESCRIPTION

CD-1C912-01
ISSUE 3B
APPENDIX 3B
DWG ISSUE 14B
DISTN CODE 1N98

COMMON SYSTEMS
MAINTENANCE FRAME
CIRCUIT
ARRANGED FOR ESS NO. 2B AND 3

CHANGES

D. Description of Changes

D.1 Added optional wiring between the system status panel controller circuit and the system status panel relay circuit to connect an optional, remotely installed dial tone delay alarm circuit to the E2A telemetry circuit critical alarm indicator in the Switching Control Centers.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 2511-CE-TSG

Printed in U.S.A.

CIRCUIT DESCRIPTION

CD-1C912-01
ISSUE 3B
APPENDIX 2BU
DWG ISSUE 13BU
DISTN CODE 1N98

COMMON SYSTEMS
MAINTENANCE FRAME
CIRCUIT
ARRANGED FOR ESS NO. 2B AND 3

D. Description of Changes

D.1 Added options S and T to permit ordering of the frame without the teletypewriter controller circuit, specifically for 1A VSS.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 2511-CE-TSG

Printed in U.S.A.

CIRCUIT DESCRIPTION

CD-1C912-01
ISSUE 3B
APPENDIX 1B
DWG ISSUE 12B
DISTN CODE 1N98

COMMON SYSTEMS

MAINTENANCE FRAME CIRCUIT

ARRANGED FOR ESS NO. 2B AND 3

CHANGES

D. Description of Changes

D.1 Provided connecting information for office identification bits to the E2A telemetry unit when used in auxiliary processor applications. Made lead and option changes and additions to FS 4, CAD 65 and CAD 142. Described details in Information Notes 307 and 308.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 2511-CE-TSG

Printed in U.S.A.

COMMON SYSTEMS

MAINTENANCE FRAME CIRCUIT

ARRANGED FOR ESS NO. 2B AND 3

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 The maintenance frame circuit specifies the interframe and intraframe connections pertinent to all units appearing in the maintenance frame.

SECTION II - DETAILED DESCRIPTION

1. GENERAL

1.01 This circuit is a connecting circuit for units appearing in the maintenance frame. In most cases, operational interaction between units appearing in this frame is specified in one or more of the circuit SD/CD documents pertaining to those units. The units appearing in this frame, from top to bottom, are as follows:

(a) E2A Telemetry Unit - SD-2P021-01

(b) Tape Data Controller 0 - SD-1C904-01

(c) Tape Data Controller 1 - SD-1C904-01

(d) System Status Panel/System Status Panel Controller - SD-1C906-01/ SD-1C907-01

(e) TTY

(f) TTY Controller Unit 0 - SD-1C905-01

(g) TTY Controller Unit 1 - SD-1C905-01

(h) System Status Panel Relay Unit - SD-1C908-01

(i) Maintenance Frame Power Unit - SD-1C909-01.

2. FRAME POWER CONNECTIONS - FS 1

2.01 FS 1 contains connecting information for fusing and power alarms appearing on the maintenance frame circuit. The -48 Vdc power and +24 Vdc power with their associated returns from the central office (CO) power distribution circuits are provided through four ED-5A079-10 connectors (-48BA, -48BB, +24AA, and +24AB). The +24 Vdc power is filtered by a 10,000-UF capacitor paralleled by a 3300-ohm resistor to ground. The +24 Vdc power and -48 Vdc power are then distributed to the appropriate fuse blocks for further distribution via the maintenance frame power circuit fuses, shown as symbol No. 9 of the SD interconnection and flow (IC&F) diagram.

2.02 Symbol No. 10 represents the A8 power modules that supply +3 Vdc power to the system status panel controller (SSPC) circuit. Symbols 11, 12, and 13 represent the power distribution to the SSPC, system status panel (SSP), which is not shown, system status panel relay unit (SSPR), and maintenance frame power circuit. The power alarm (PA) circuit wiring between units within this frame and circuits external to the frame also is shown. The latter includes alarm indicators and scan points to be monitored by the user system (see 6.01). Symbols 14, 15 and 16, 17 represent the power circuits for the teletype controller (TTYC) and the tape data controller (TDC) circuits, respectively.

POWER ALARM TEST

2.03 The PA circuits appearing in the maintenance frame may be tested on a limited basis by a series connection of all PA terminals appearing in the frame. This connection provides the ability to test the minor alarm indicator circuits and the integrity of the series-connected PA net. A more detailed account of the PA test is available in SD/CD-1C909-01 (maintenance frame power circuit), where most of the PA control logic is located.

KEYBOARD BLIND FEATURE

2.04 The power connection for the keyboard blind feature is shown on symbol 9. Option X provides -48 Vdc power for the keyboard blind feature provided with M35 KSR TTYs equipped with USOC NTFNN.

3. I/O AND INTERRUPT CIRCUITS TO CC - FS 2

3.01 This FS shows the I/O and interrupt assignments of all such leads connected between units appearing in the maintenance frame and the 3A CCs. In general, the I/O and interrupt interconnections are via 100-ohm coaxial cables.

4. TTYC PORT CONNECTORS - FS 3

4.01 FS 3 shows the connecting information for TTY controller circuits. There are two TTY controller units in the maintenance frame. Each unit contains two TTYC circuits, and each circuit has four ports, each capable of controlling one TTY. The two TTYC units are numbered 0 (top) and 1 (bottom). The TTYC circuits are numbered 0 through 4, with even-numbered TTYC circuits (0 and 2) appearing in TTYC unit 0 and odd-numbered TTYC circuits (1 and 3) appearing in TTYC unit 1. The TTYC ports may be interconnected to form specific operational configurations, eg, No. 2B ESS mate operation. When the TTY port switch (a remote circuit) is used in No. 2B ESS, port configurations and line and/or TTY connecting information is available in CD/SD-2H227-01. Other connecting information for TTYC circuits is available in CD/SD-1C905-01.

5. E2A TELEMETRY-TO-SSPC INTERCONNECTIONS - FS 4

5.01 The E2A telemetry provides a communications link between an SSPC and a switching control center (SCC). The SCC is thus able to monitor the system status and execute certain emergency control operations for a specific system. The SCC communicates with the E2A via an asynchronous serial data link. The E2A parallel scans the SSPC on a per-function basis. The E2A also shares control of selected SSPC functions with the SSP switch related to the function on an ORed basis. The control signals from the E2A to the SSPC are transmitted via coaxial cable, and the scanned SSPC functions are transmitted to the E2A via tight-twisted pair. SD-2P021-01 (E2A remote) contains specific assignments for SSP functions, and SD-1C907-01 contains connecting information that relates functional names to connector pin assignments (see Circuit Note 105 on SD-1C907-01).

6. SYSTEM ALARM RELAY INTERFACE - FS 5

6.01 The system alarm relay interface contains those functions that provide alarm information to CC and system monitor circuits. Several relay contacts are wired to TS1 on the SSPR circuit. These contacts may be utilized as required by the user system. The user typically provides the signal source and return path, with the maintenance frame circuits providing a relay contact for control. The intended exceptions to this mode of operation are the SSP circuit power switch and the test control "execute" function of the SSP.

6.02 The SSP circuit power switch, when operated, provides a ground return path through a 510-ohm resistor (net PA). Net PB2 provides the +24 Vdc source voltage for this function via R8 (510 ohms). The outputs PA and PB are to be connected to a scanner ferrod requiring less than 20-mA saturation current. These outputs shall be equipped with a noise suppression resistor in No. 2B ESS applications as shown on symbol 3 per Information Note 305. If another device is used to monitor this function, the resistance of the device must be considered to determine the available saturation current.

6.03 The test control "execute" function is controlled by relay PF in the SSPR. Operation of this relay requires a ground on either input PFROA or PFROB. A paired lead may be used, with ground provided by net PFROG. A contact closure provides the ground signal, from the maintenance frame, via user circuit, back to the PF relay in the maintenance frame. Many contacts may be paralleled across the PFROA, PFROB, and PFROG nets as required by the user, but the contacts should be connected frame to frame as shown in Information Note 302.

6.04 When the TTY port switch (see CD/SD-2H227-01) is used in No. 2B ESS application, it is controlled by a switch on the SSP. The port switch, a remote unit, is controlled by the IPA relay outputs shown on symbol 2 of SD-1C912-01.

7. SYNCHRONOUS DATA SET CONTROLLER - FS 6

7.01 FS 6 shows the interconnections between the synchronous data set controller (SDSC) portion of the tape data controllers (TDC) and the external data sets used with the SDSC feature. Currently, only No. 2B ESS E/W EF-2 generic will use this feature, and only on TDC0. The SDSC is a user-specified option that allows transmission of main store contents to and from a remote location (see Information Note 304).

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.01 None.

2. FUNCTIONAL DESIGNATIONS

2.01 None.

3. FUNCTIONS

3.01 Provides interframe and intraframe wiring information for units appearing in this frame.

4. CONNECTING CIRCUITS

4.01 When this circuit is listed on a keysheet, the connecting information thereon should be followed.

(a) Tape Data Controller - SD-1C904-01.

(b) TTY Controller Unit -SD-1C905-01.

(c) System Status Panel - SD-1C906-01.

(d) System Status Panel Controller - SD-1C907-01.

(e) System Status Panel Relay Unit - SD-1C908-01.

(f) Maintenance Frame Power Unit - SD-1C909-01.

(g) E2A Telemetry Unit - SD-2P021-01.

5. MANUFACTURING TESTING REQUIREMENTS

5.01 The manufacturing testing requirements are specified in X-76890.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5515-DAH-LEC

SECTION IV - REASONS FOR REISSUE

1. Description of Changes

D.1 Provided complete CD information.

3

COMMON SYSTEMS

MAINTENANCE FRAME
CIRCUIT

ARRANGED FOR ESS NO. 2B AND 3

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 The maintenance frame circuit specifies the interframe and intraframe connections pertinent to all units appearing in the maintenance frame.

SECTION II - DETAILED DESCRIPTION

1. GENERAL

1.01 This circuit is a connecting circuit for units appearing in the maintenance frame. In most cases, operational interaction between units appearing in this frame is specified in one or more of the circuit SD/CD documents pertaining to those units. The units appearing in this frame, from top to bottom, are as follows:

(a) E2A Telemetry Unit - SD-2P021-01

(b) Tape Data Controller 0 - SD-1C904-01

(c) Tape Data Controller 1 - SD-1C904-01

(d) System Status Panel/System Status Panel Controller - SD-1C906-01/ SD-1C907-01

(e) TTY

(f) TTY Controller Unit 0 - SD-1C905-01

(g) TTY Controller Unit 1 - SD-1C905-01

(h) System Status Panel Relay Unit - SD-1C908-01

(i) Maintenance Frame Power Unit - SD-1C909-01.

2. FRAME POWER CONNECTIONS - FS 1

2.01 FS 1 contains connecting information for fusing and power alarms appearing on the maintenance frame circuit. The -48 Vdc power and +24 Vdc power with their associated returns from the central office (CO) power distribution circuits are provided through four ED-5A079-10 connectors (-48BA, -48BB, +24AA, and +24AB). The +24 Vdc power is filtered by a 10,000-UF capacitor paralleled by a 3300-ohm resistor to ground. The +24 Vdc power and -48 Vdc power are then distributed to the appropriate fuse blocks for further distribution via the maintenance frame power circuit fuses, shown as symbol No. 9 of the SD interconnection and flow (IC&F) diagram.

2.02 Symbol No. 10 represents the A8 power modules that supply +3 Vdc power to the system status panel controller (SSPC) circuit. Symbols 11, 12, and 13 represent the power distribution to the SSPC, system status panel (SSP), which is not shown, system status panel relay unit (SSPR), and maintenance frame power circuit. The power alarm (PA) circuit wiring between units within this frame and circuits external to the frame also is shown. The latter includes alarm indicators and scan points to be monitored by the user system (see 6.01). Symbols 14, 15 and 16, 17 represent the power circuits for the teletype controller (TTYC) and the tape data controller (TDC) circuits, respectively.

POWER ALARM TEST

2.03 The PA circuits appearing in the maintenance frame may be tested on a limited basis by a series connection of all PA terminals appearing in the frame. This connection provides the ability to test the minor alarm indicator circuits and the integrity of the series-connected PA net. A more detailed account of the PA test is available in SD/CD-1C909-01 (maintenance frame power circuit), where most of the PA control logic is located.

KEYBOARD BLIND FEATURE

2.04 The power connection for the keyboard blind feature is shown on symbol 9. Option X provides -48 Vdc power for the keyboard blind feature provided with M35 KSR TTYs equipped with USOC NTFNN.

3. I/O AND INTERRUPT CIRCUITS TO CC - FS 2

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4.01 FS 3 shows the connecting information for TTY controller circuits. There are two TTY controller units in the maintenance frame. Each unit contains two TTYC circuits, and each circuit has four ports, each capable of controlling one TTY. The two TTYC units are numbered 0 (top) and 1 (bottom). The TTYC circuits are numbered 0 through 4, with even-numbered TTYC circuits (0 and 2) appearing in TTYC unit 0 and odd-numbered TTYC circuits (1 and 3) appearing in TTYC unit 1. The TTYC ports may be interconnected to form specific operational configurations, eg, No. 2B ESS mate operation. When the TTY port switch (a remote circuit) is used in No. 2B ESS, port configurations and line and/or TTY connecting information is available in CD/SD-2H227-01. Other connecting information for TTYC circuits is available in CD/SD-1C905-01.

5. E2A TELEMETRY-TO-SSPC INTERCONNECTIONS - FS 4

5.01 The E2A telemetry provides a communications link between an SSPC and a switching control center (SCC). The SCC is thus able to monitor the system status and execute certain emergency control operations for a specific system. The SCC communicates with the E2A via an asynchronous serial data link. The E2A parallel scans the SSPC on a per-function basis. The E2A also shares control of selected SSPC functions with the SSP switch related to the function on an CPed basis. The control signals from the E2A to the SSPC are transmitted via coaxial cable, and the scanned SSPC functions are transmitted to the E2A via tight-twisted pair. SD-2P021-01 (E2A remote) contains specific assignments for SSP functions, and SD-1C907-01 contains connecting information that relates functional names to connector pin assignments (see Circuit Note 105 on SD-1C907-01).

6. SYSTEM ALARM RELAY INTERFACE - FS 5

6.01 The system alarm relay interface contains those functions that provide alarm information to CC and system monitor circuits. Several relay contacts are wired to TS1 on the SSPR circuit. These contacts may be utilized as required by the user system. The user typically provides the signal source and return path, with the maintenance frame circuits providing a relay contact for control. The intended exceptions to this mode of operation are the SSP circuit power switch and the test control "execute" function of the SSP.

6.02 The SSP circuit power switch, when operated, provides a ground return path through a 510-ohm resistor (net PA). Net PB2 provides the +24 Vdc source voltage for this function via R8 (510 ohms). The outputs PA and PB are to be connected to a scanner ferrod requiring less than 20-mA saturation current. These outputs shall be equipped with a noise suppression resistor in No. 2B`ESS applications as shown on symbol 3 per Information Note 305. If another device is used to monitor this function, the resistance of the device must be considered to determine the available saturation current.

6.03 The test control "execute" function is controlled by relay PF in the SSPR. Operation of this relay requires a ground on either input PFR0A or PFR0B. A paired lead may be used, with ground provided by net PFR0G. A contact closure provides the ground signal, from the maintenance frame, via user circuit, back to the PF relay in the maintenance frame. Many contacts may be paralleled across the PFR0A, PFR0B, and PFR0G nets as required by the user, but the contacts should be connected frame to frame as shown in Information Note 302.

6.04 When the TTY port switch (see CD/SD-2H227-01) is used in No. 2B`ESS application, it is controlled by a switch on the SSP. The port switch, a remote unit, is controlled by the IEA relay outputs shown on symbol 2 of SD-1C912-01.

7. SYNCHRONOUS DATA SET CONTROLLER - FS 6

7.01 FS 6 shows the interconnections between the synchronous data set controller (SDSC) portion of the tape data controllers (TDC) and the external data sets used with the SDSC feature. Currently, only No. 2B ESS E/W EF-2 generic will use this feature, and only on TDC0. The SDSC is a user-specified option that allows transmission of main store contents to and from a remote location (see Information Note 304).

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.01 None.

2. FUNCTIONAL DESIGNATIONS

2.01 None.

3. FUNCTIONS

3.01 Provides interframe and intraframe wiring information for units appearing in this frame.

4. CONNECTING CIRCUITS

4.01 When this circuit is listed on a keysheet, the connecting information thereon should be followed.

(a) Tape Data Controller - SD-1C904-01.

(b) TTY Controller Unit -SD-1C905-01.

(c) System Status Panel - SD-1C906-01.

(d) System Status Panel Controller - SD-1C907-01.

(e) System Status Panel Relay Unit - SD-1C908-01.

(f) Maintenance Frame Power Unit - SD-1C909-01.

(g) E2A Telemetry Unit - SD-2P021-01.

5. MANUFACTURING TESTING REQUIREMENTS

5.01 The manufacturing testing requirements are specified in X-78890.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5515-DAH-LEC

SECTION IV - REASONS FOR REISSUE

1. Description of Changes

D.1 Provided complete CD information.